

# MAXWELL JONES

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**Objective:** Summer 2023 internship  
in SWE/ML Research

Planning to pursue a fifth year  
Masters and expecting to graduate  
in **May 2024** after receiving dual  
Bachelors degrees in AI & Math

## Skills

### PROGRAMMING LANGUAGES

Python  
Java  
C  
JavaScript  
HTML / CSS  
LaTeX  
SQL  
Julia

### TOOLS/Frameworks

NumPy  
Pytorch  
SciPy  
Unix Command Line  
Git  
Sklearn  
Keras  
Pandas  
Jupyter Notebook  
regex  
Matplotlib  
OpenCV  
Slurm

### COURSEWORK

15-485 Intro to Deep Learning  
16-385 Computer Vision  
10-703 Deep Reinforcement  
Learning  
10-725 Convex Optimization  
10-315 Intro to Machine Learning  
15-281 Artificial Intelligence  
15-210 Parallel Algorithms  
15-213 Computer Systems  
21-484 Graph Theory  
15-251 Theoretical Computer  
Science

### HOBBIES/INVOLVEMENT

Origami Club (Treasurer)  
Carnegie Mellon Club Basketball  
NSBE (National Society of Black  
Engineers)  
Kappa Sigma Fraternity  
Carnegie Mellon Intramural  
Volleyball

## Education

Carnegie Mellon University  
BS Artificial Intelligence 2023 (Planned Masters Graduating 2024)  
BS Math 2023  
GPA: 4.0/4.0  
Sept. 2019 to Current

Thomas Jefferson High School for Science and Technology  
High School Diploma 2019  
GPA: 4.1/5.0  
Sept. 2015 to May 2019

## Employment

Meta | FAIR Labs  
Software Engineer/Machine Learning Intern  
New York City, NY  
May 2022 to Aug. 2022

- Co-authoring paper to benchmark algorithmic **Bias Amplification** of models from biased datasets
- Using **ResNet-18**, **ClassyVision** and **Pytorch** to benchmark bias for controlled subsets of **The Visual Genome** dataset
- Creating custom datasets, running experiments with **Slurm**, and **Cleaning Data** for **Image Classification**
- Developed **Scripts** to run **Custom Config Files** using both **Bash** and **Python** for large scale hyperparameter testing/analysis
- **Managed project tasks** for myself and co-authors on **Computer Vision** FAIR team through weekly meetings, syncs and idea sharing

Meta | Probability and Uncertainty  
Software Engineer Intern  
Remote  
May 2021 to Aug. 2021

- Developed data perturbation training/evaluating/testing pipeline in **Python**, leveraging **Pytorch** for main testing
- Tested probabilistic models including **Bayesian**, **Ensemble**, and **Dropout** focused networks modeled off of **LeNet-5**
- Evaluated models on perturbed image data (**Random Cropping**, **Rotation**, **Jittering**)
- Used **MNIST** and **FashionMNIST** datasets for testing, Created visualizations using **Matplotlib** for presentation

Carnegie Mellon University  
Head Teaching Assistant 15-151 (Discrete Math), Teaching Assitant 15-251 (CS Theory)  
Pittsburgh, PA  
Fall 2020 to Current

- Over 2+ years, **Head TA** for **50+ TAs**, impacting **500+ students** (Concepts of Mathematics, Theoretical CS)
- Responsible for **hiring**, **providing training** and **assessing performance** for TAs
- Contributed significantly to **course structure generation** and **exam creation**
- **Design/Lead staff meetings**, coordinate **TA-Professor interactions**, **delegate TA responsibilities**

Fiat Chrysler Automobiles  
Data Science Intern  
Remote  
May 2020 to Aug. 2020

- Worked on amount of absentee workers prediction model across production plants
- **Significant increase in model accuracy** for absentee worker prediction at all plants (2% increase, 5000+ employees)
- Improved model performance by using **Random Forests** and **XGBoost**, cross referencing crew attendance across plants
- Queried data from **PostgreSQL** database and used **Pandas** library to store query results

## Projects

Semi Supervised Learning Research, Carnegie Mellon University  
Fall 2021 to Current

- Support PHD-level research in scalable graph-based Semi-Supervised Learning project
- Use **Python** and **SciPy**, find **Harmonic Objectives**, leverage **K-Nearest Neighbor** graphs and fast iterative solvers
- Perform evaluation on **MNIST**, **CIFAR**, and common **NLP** datasets (20-newsgrroups) with **Sklearn** using **Bag of Words**
- Achieved **same accuracy**, **100x speedup** on large graphs with respect to closed form solutions with matrix inverses
- Used **Image Embeddings** from layer 2 of **Resnet-18** adapted for CIFAR in order to clean up more difficult image classification problem

Battlecode AI Competition (codebase)  
Jan. 2022

- Created **Java** software on small team, for AI bot to compete against other teams in month-long MIT lead tournament
- Combined 500+ person-hours, 2000+ lines of code in both 2021 and 2022
- Leveraged **distributed** communication **algorithms** and **pathfinding** to increase bot's effectiveness
- Implemented **bit packing** methods, **Priority Queues** and **Stacks**, and **K-Means Clustering** to improve performance
- Placed top 10 out of 250 teams internationally(2021, 2022), 1st out of all first-time teams(2021), **\$2000+ in prize winnings**

TartanHacks: Spot your Mood! (codebase)  
Feb. 2021

- Competed in Carnegie Mellon's main Hackathon on team of 4
- Created an add on for **Spotify** using **Python** and **Flask** to track mood of users listening
- Developed **Vector Embeddings** for mood based on **Spotify API** metadata and sentiment analysis
- Used **Euclidean Distance** in the **Embedding Space** to execute recommendation decisions
- Functionality for both song and playlist generation based on mood factors and specific genre choices

TartanHacks: WalkSafe! (codebase)  
Feb. 2020

- Developed a Python program on team of 4 that calculates safe and efficient walking paths at night in New York City
- Created a weighted graph from crime and street data and implemented an **A\* Pathfinding** algorithm
- Integrated **Open Street Map API** and fetched data from NYPD crime database REST endpoint